FIG. 1

OPERATION CODE	RD	RS1	RS2	VALUE PREDICTION FIELD
1	2	3	4	5

FIG. 2

OPERATION CODE	RD	RS1	RS2	VALUE PREDICTION FIELD	VALUE PREDICTION METHOD
1	2	3	4	5	6

FIG. 3

FIG. 4

20

INSTRUCTION CACHE	
INSTRUCTION	VALUE PREDICTION FIELD
INSTRUCTION	VALUE PREDICTION FIELD
INSTRUCTION	VALUE PREDICTION FIELD
⋮	⋮
INSTRUCTION	VALUE PREDICTION FIELD

7　　　　　　　　8

FIG. 5

20

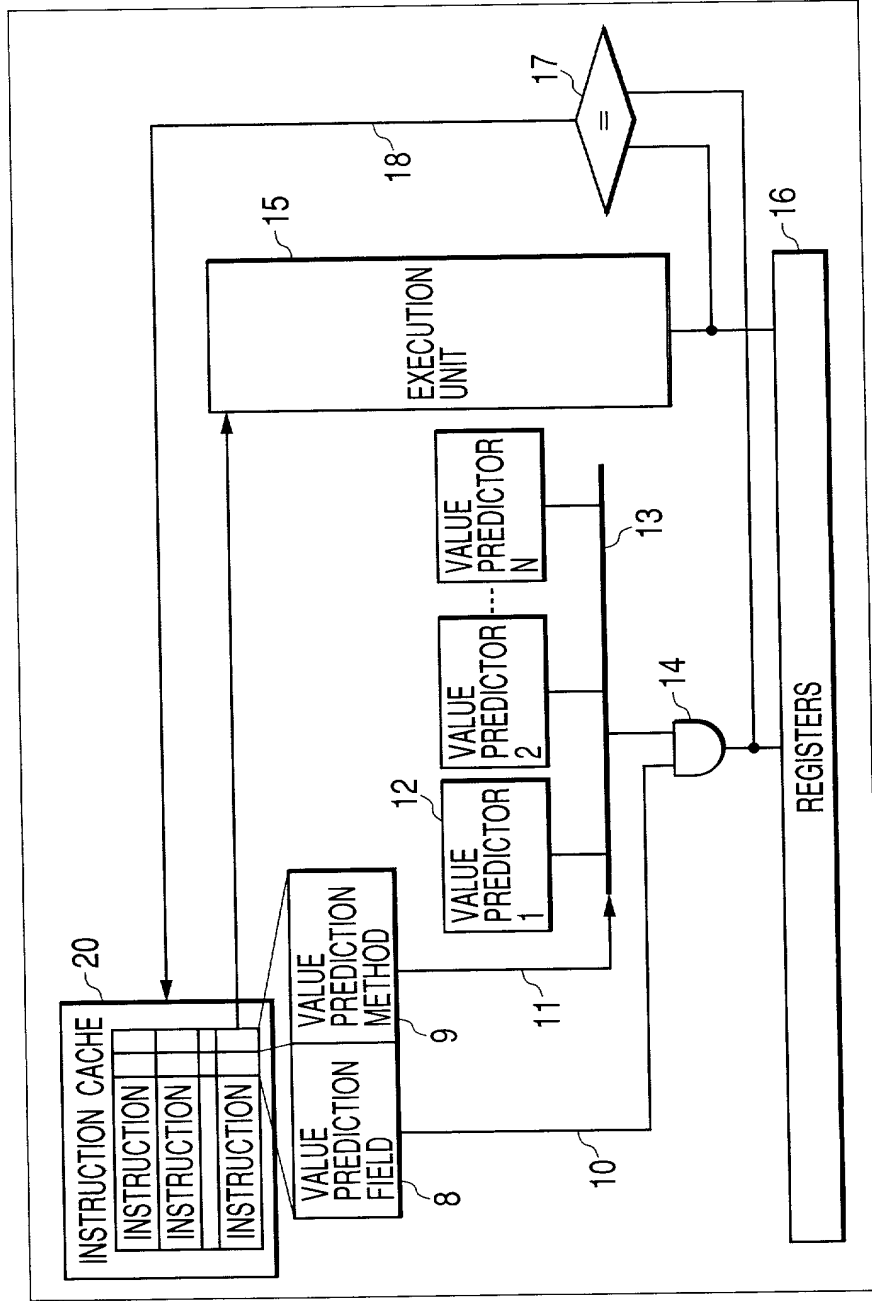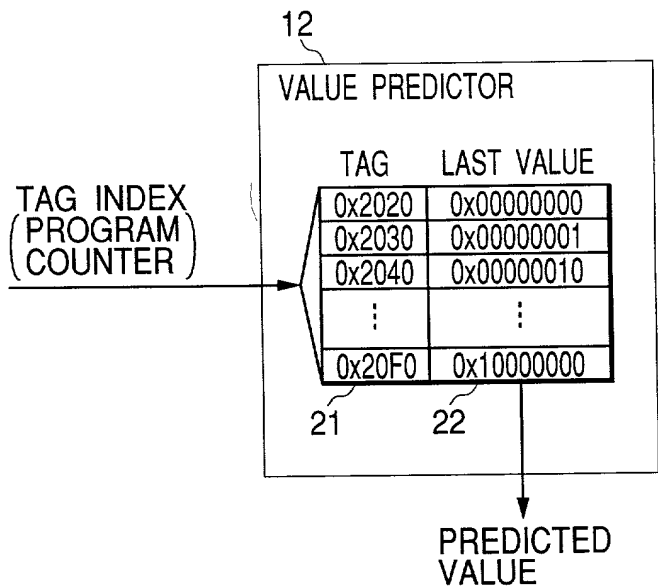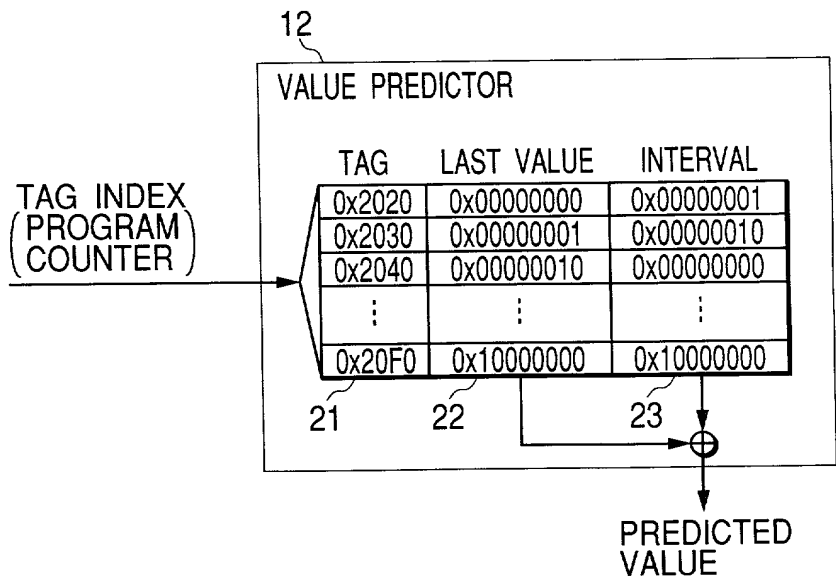| INSTRUCTION CACHE		
INSTRUCTION	VALUE PREDICTION FIELD	VALUE PREDICTION METHOD
INSTRUCTION	VALUE PREDICTION FIELD	VALUE PREDICTION METHOD
INSTRUCTION	VALUE PREDICTION FIELD	VALUE PREDICTION METHOD
⋮	⋮	⋮
INSTRUCTION	VALUE PREDICTION FIELD	VALUE PREDICTION METHOD

7　　　　　　　8　　　　　　　　9

FIG. 6

FIG. 7

12

VALUE PREDICTOR

TAG INDEX
(PROGRAM
COUNTER)

	TAG	LAST VALUE
	0x2020	0x00000000
	0x2030	0x00000001
	0x2040	0x00000010
	⋮	⋮
	0x20F0	0x10000000

21   22

PREDICTED
VALUE

FIG. 8

12

VALUE PREDICTOR

TAG INDEX
(PROGRAM
COUNTER)

TAG	LAST VALUE	INTERVAL
0x2020	0x00000000	0x00000001
0x2030	0x00000001	0x00000010
0x2040	0x00000010	0x00000000
⋮	⋮	⋮
0x20F0	0x10000000	0x10000000

21   22   23

⊕

PREDICTED
VALUE

FIG. 9

12

VALUE PREDICTOR

TAG INDEX
(PROGRAM
COUNTER)

TAG	OFFSET VALUE	HISTORY
0x2020	0x00000000	0000
0x2030	0x00000001	0010
0x2040	0x00000010	1000
⋮	⋮	⋮
0x20F0	0x10000000	1101

21   24   25

HISTORY TAG	LINK VALUE
0000	0x00000000
0001	0x00000001
0010	0x00000010
⋮	⋮
1111	0x10000000

26   27

⊕

PREDICTED VALUE

FIG. 10
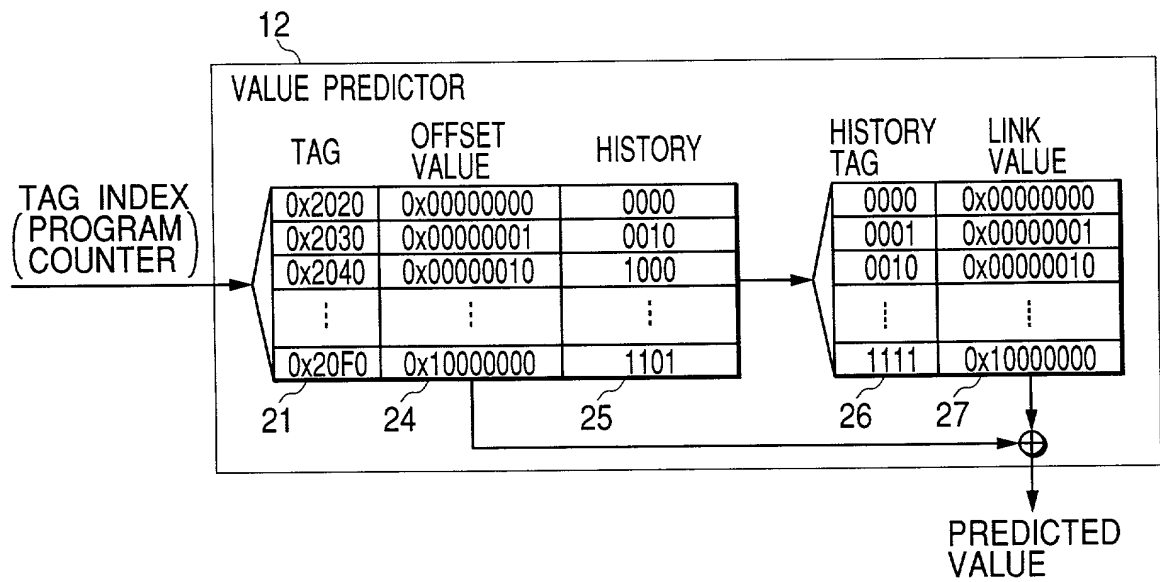
```
0x2020      xor r1, r1, r1      : r1=0              r1 IS ALWAYS 0
            loop :
0x2024      add r2, r1, 0x4     : r2=r1+4=4         r2 IS ALWAYS 4
0x2028      add r3, r1, 0x8     : r3=r1+8=8         r3 IS ALWAYS 8
0x202C      add r4, r1, 0xC     : r4=r1+12=12       r4 IS ALWAYS 12
0x2030      bc loop             : loop
```

FIG. 11

```
0x2020      xor r1, r1, r1      : r1=0         THE INITIAL VALUE OF r1 IS 0
            loop :
0x2024      add r1, r1, 0x1     : r1=r1+1      r1 INCREASES BY 1 EVERY TIME
0x2028      add r2, r1, 0x4     : r2=r1+4      r2 INCREASES BY 1 EVERY TIME
0x202C      add r3, r1, 0x8     : r3=r1+8      r3 INCREASES BY 1 EVERY TIME
0x2030      add r4, r1, 0xC     : r4=r1+12     r4 INCREASES BY 1 EVERY TIME
0x2034      bc loop             : loop
```

FIG. 12

```
0x2020      xor r1, r1, r1          : r1=0
0x2024      add r1, r1, 0x1         : r1=r1+1=1   THE INITIAL VALUE OF r1 IS 1
            loop :
0x2028      mul r1, r1, −0x1        : r1=r1×(−1)  r1 ALTERNATES BETWEEN −1 AND 1
0x202C      add r2, r1, 0x4         : r2=r1+4     r2 ALTERNATES BETWEEN 3 AND 5
0x2030      add r3, r1, 0x8         : r3=r1+8     r3 ALTERNATES BETWEEN 7 AND 9
0x2034      add r4, r1, 0xC         : r4=r1+12    r4 ALTERNATES BETWEEN 11 AND 13
0x2038      bc loop                 : loop
```

FIG. 13
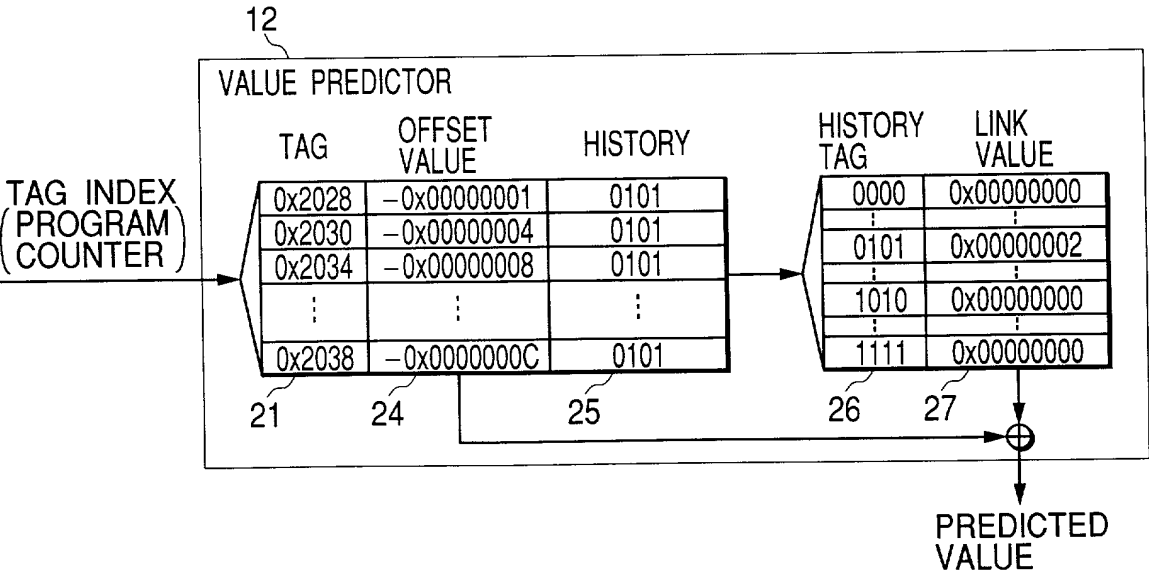
FIG. 14

0x2020	ld r1, adr	: r1←Mem [adr]	LOAD THE VALUE ON r1 FROM MEMORY
	loop :		
0x2024	add r2, r1, 0x4	: r2=r1+4=4	r2 IS ALWAYS 4
0x2028	add r3, r1, 0x8	: r3=r1+8=8	r3 IS ALWAYS 8
0x202C	add r4, r1, 0xC	: r4=r1+12=12	r4 IS ALWAYS 12
0x2030	bc loop	: loop	

FIG. 15

0x2020	ld r1, adr	: r1←Mem [adr]	LOAD THE VALUE ON r1 FROM MEMORY
	loop :		
0x2024	add r1, r1, 0x1	: r1=r1+1	r1 INCREASES BY 1 EVERY TIME
0x2028	add r2, r1, 0x4	: r2=r1+4	r2 INCREASES BY 1 EVERY TIME
0x202C	add r3, r1, 0x8	: r3=r1+8	r3 INCREASES BY 1 EVERY TIME
0x2030	add r4, r1, 0xC	: r4=r1+12	r4 INCREASES BY 1 EVERY TIME
0x2034	bc loop	: loop	

FIG. 16

```
0x2020      xor r1, r1, r1      : r1 = 0
0x2024      ld r1, adr          : r1←Mem [adr]   LOAD THE VALUE TO r1 FROM
                                                 MEMORY
            loop :
0x2028      mul r1, r1, −0x1    : r1 = r1 × (−1)  r1 ALTERNATES BETWEEN −1 AND 1
0x202C      add r2, r1, 0x4     : r2 = r1 + 4     r2 ALTERNATES BETWEEN 3 AND 5
0x2030      add r3, r1, 0x8     : r3 = r1 + 8     r3 ALTERNATES BETWEEN 7 AND 9
0x2034      add r4, r1, 0xC     : r4 = r1 + 12    r4 ALTERNATES BETWEEN 11 AND 13
0x2038      bc loop             : loop
```

FIG. 17

1	2	3	4	5	6	28
OPERATION CODE	RD	RS1	RS2	VALUE PREDICTION FIELD	VALUE PREDICTION METHOD	COMPULSORY VALUE PREDICTION

FIG. 18

20

INSTRUCTION CACHE			
INSTRUCTION	VALUE PREDICTION FIELD	VALUE PREDICTION METHOD	COMPULSORY VALUE PREDICTION
INSTRUCTION	VALUE PREDICTION FIELD	VALUE PREDICTION METHOD	COMPULSORY VALUE PREDICTION
INSTRUCTION	VALUE PREDICTION FIELD	VALUE PREDICTION METHOD	COMPULSORY VALUE PREDICTION
⋮	⋮	⋮	⋮
INSTRUCTION	VALUE PREDICTION FIELD	VALUE PREDICTION METHOD	COMPULSORY VALUE PREDICTION
7	8	9	29

FIG. 19